Carson river MerCury superfund site

Community involvement Plan

United States Environmental Protection Agency

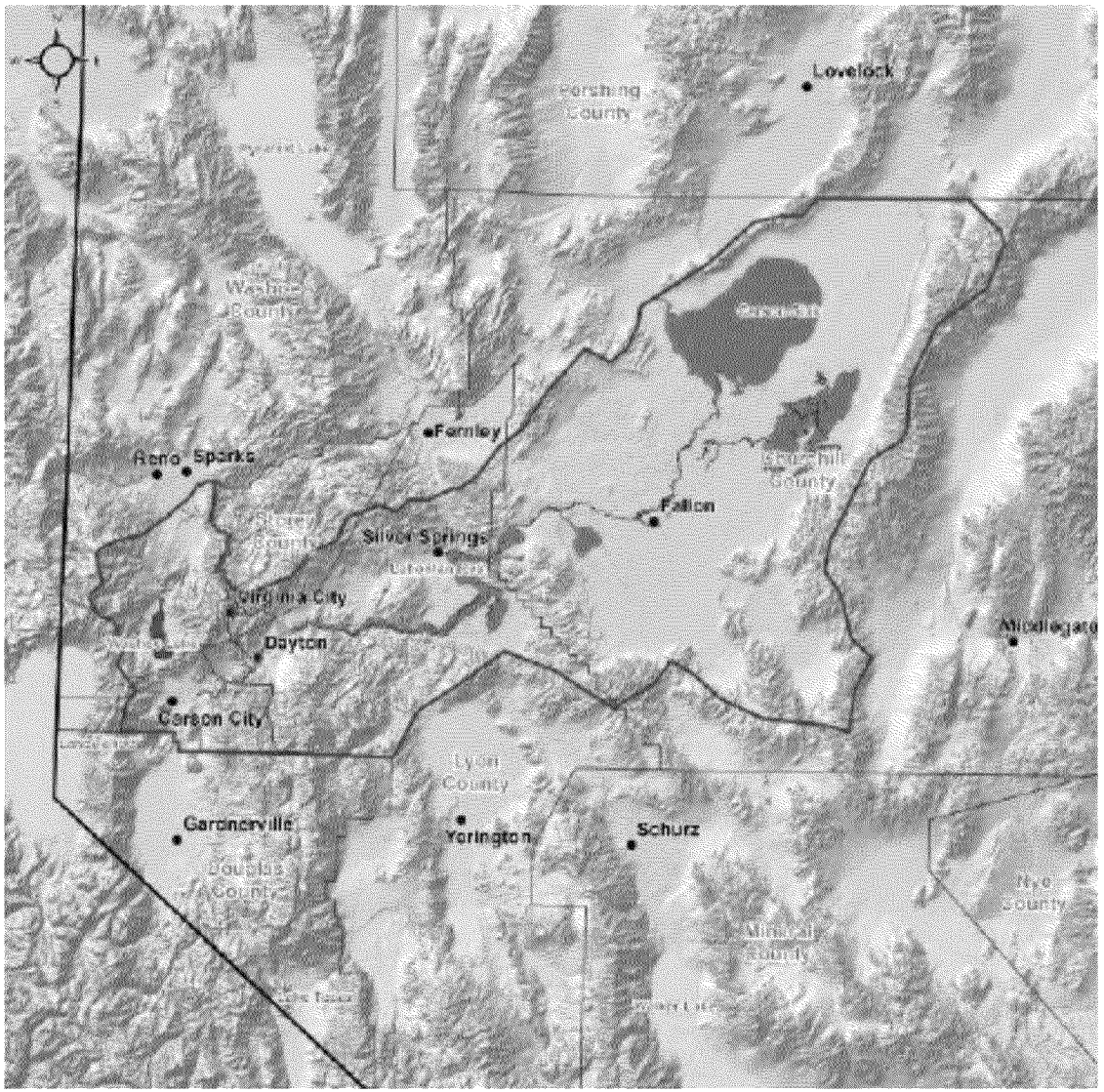
July 2015

introduCtion

In 2013, the U.S. Environmental Protection Agency (EPA) conducted interviews with many stakeholders and community members. The information received from those interviews has contributed greatly to the creation of this Community Involvement Plan (CIP). The interviewees shared their knowledge, concerns, and input on a variety of topics related to the CRMS. This CIP synthesizes their responses and creates a comprehensive plan, describing the pathways through which positive communication between EPA and the CRMS communities can continue successfully.

Carson River Mercury Superfund Site (CRMS or Site) spans Washoe, Carson City, Storey, Lyon, and Churchill Counties in Nevada.

The CRMS begins on the eastern edge of Carson City, Nevada and includes more than 80 miles of mercury-contaminated river, reservoir, wetland water and sediments in the middle and lower portions of the Carson River system. It also includes soils and tailings at more than 200 mill sites where mercury was used to process gold and silver ore mined from the **Comstock Lode**. The CRMS also encompasses areas where mercury contamination has come to reside due to erosion from the mill sites, including the six historic mills on the banks of Washoe Lake.



Carson River Mercury Superfund Site

Community involvement Plan organization

t h e Community

t h e Community & stakeholders

Spanning five counties and two tribal land areas in western Nevada, the Carson River Mercury Site offers a unique community profile. This creates a diverse group of stakeholders, including local governments, tribes, schools, industry, developers, naturalists and those looking for recreation throughout the area.

According to the United States Census Bureau 2013 estimates, the populations of the Nevada counties comprising the CRMS are as follows: Washoe County, 433,731; Carson City County, 54,080; Storey County, 3,942; Lyon County, 51,557; and Churchill County, 24,063. The vast majority of the population of Washoe County is located in the Reno-Sparks metropolitan area, which is outside the boundaries of the CRMS. In fact, the majority of residents from each of the five listed counties do not reside within the CRMS boundaries.

Community understanding of the ise

Community members are, for the most part, aware that the river is contaminated from historical practices. The specific details of the cleanup, however, are less well known. When interviewed, many residents were unfamiliar with the potential exposure pathways, the role of EPA in the cleanup, and the active fish advisory. A goal of this plan is to clarify communication of these details to residents.

Carson River Mercury Superfund Site

Crms stakeholders

The Nevada Division of Environmental Protection (NDEP) is EPA's official State counterpart agency. EPA provides NDEP with a State Cooperative Agreement to assist with the investigation activities. This is a fund-lead Superfund Site, meaning a potentially responsible party has not been identified for the contamination. Therefore, the two agencies share the cost of implementing the remedy. NDEP has contributed extensively to the Historic Site Assessment, conducted soil sampling work to define the extent of contamination, participated in numerous community involvement activities and reviewed EPA's draft documents for technical and policy purposes.

Due to the large scope of the Site, it is necessary for EPA to coordinate with several different groups on a local, state, and national level. These groups range from community organized to federally funded, all playing an important role in the Carson River area. Below find a list of many, but not all, of the groups EPA and NDEP work with in the CRMS.

Coordination with state and local groups:

Across CRMS:
- U.S. Geological Survey (USGS)
- U.S. Bureau of Land Management (BLM)
- Nevada Department of Wildlife
- U.S. Fish and Wildlife Service (USFWS)
- Governor's Office
- Homeowners associations
- School Districts
- Northern Nevada Chambers of Commerce
- University of Nevada Reno
- Truckee Carson Irrigation District
- Indian Health Service
- Ducks Unlimited
- Carson Water Subconservancy District
- U.S. Bureau of Reclamation
- Carson River Wranglers

Carson City County:
- Carson City County Commissioner
- Open Space Advisory Committee
- Trout Unlimited
- Hispanic Chamber of Commerce of Northern Nevada
- United Latino Community

Storey County:
- Storey County Commissioner
- Healthy Communities Coalition of Lyon and Storey Counties
- Community Chest

Lyon County:
- Lyon County Commissioner
- Lyon County Manager
- Dayton Regional Advisory Council
- Silver City Community Advisory Board
- Healthy Communities Coalition of Lyon and Storey Counties

Churchill County
- Churchill County Commissioner

Washoe County:
- Washoe County Commissioner
- Washoe Water Planning Commission
- Washoe Tribe of Nevada and California
- Washoe Water Planning Commission
- South Truckee Meadows/ Washoe Valley Community Advisory Board
- Regional Transportation Commission

tribals takeholders

Fallon Paiute-Shoshone Tribe: The Fallon Paiute-Shoshone Tribe (FPST) of the Fallon Reservation and Colony is a Federally-recognized Indian tribe. There are two tribes that occupy the FPST Reservation, the Paiute and Shoshone Tribes.

Also known as the Toi Ticutta (cattail eaters), FPST is located in the Lahontan Basin near the tribe's sacred Fox Mountain. The FPST Reservation is located in Churchill County in West Central Nevada and has a population of approximately 1,300 people.

The name of the Tribal governing body is the Fallon Business Council (FBC). The Chief Executive of the FBC is the Chairman. The Tribal Council is composed of 7 members including the Chairman, Vice Chairman, Secretary, Treasurer, and 3 Council Members.[1]

[1]www.fpst.org

Washoe Tribe of Nevada and California: This tribe consists of several communities south and east of Lake Tahoe united under a tribal council. The tribe owns over 64,300 acres in different parcels. The tribe's headquarters are located in Gardnerville, Nevada and governed by a democratically elected 12-member tribal council and chairman. The council meets on a regular basis. The Washoe Tribe has harvested pine nuts for thousands of years from the mountain ranges near CRMS. These pine nuts are harvested from pinyon pines and are popular in both Nevada and California. The Washoe Tribe has jurisdictional interest in the Washoe Lake area.[2]

[2]www.washoetribe.us/contents

Community Concerns

EPA interviewed a wide sampling of residents and stakeholders of the CRMS. A central purpose of these interviews was to hear the community's thoughts and concerns regarding the Site. While a wide range of concerns were expressed in the interviews, they can be generally divided into three main categories: Environment and Health, Economy and Agriculture, and Recreation and Tradition. In response to these concerns, EPA developed this Community Involvement Plan to better inform and disseminate information across the CRMS. Please refer to the Appendices section to read the complete questionnaire used during community interviews.

It is important to note that each community, county and tribe within CRMS is distinct. Depending on the location and culture, concerns can be varied and diverse. Some community members are more strongly affected and concerned about the fish advisory, while other's concerns focus on soil contamination or the impact contamination has on cultural heritage. This CIP summarizes the wide range of concerns and potential risk scenarios faced by communities across the CRMS. Their individual experiences combine to form this overarching narrative.

environment and health

Due to the health problems associated with mercury exposure, people have concerns regarding the health and well-being of community members. A fact sheet from the Agency for Toxic Substance and Disease Registry provides answers to frequently asked questions about mercury and human health. The fact sheet reviews the basics of mercury and human health, including how mercury enters the environment, mercury's potential health effects and tips for reducing exposure to mercury. Find the full document here: **www.atsdr.cdc.gov/tfacts46.pdf**

Several people raised concerns for the health of their children. People would like to know more information about how, in particular, the contamination can potentially affect their health or their children's health. Many also are concerned for the elderly, especially those who have been eating fish from the Carson River or Lahontan Reservoir for years.

important human health questions posed by community:

- Does the contamination affect produce?
- Does the contamination affect groundwater?

agriculture in Carson river Watershed

surrounding states for dairy cattle and milk production. Food supplies and a variety of livestock are produced throughout the Carson River area. Beef cattle, poultry, sheep and swine are raised, as well as goats, ostriches and emus. Livestock graze on private and public rangelands and irrigated pastures throughout the watershed. There are also dairies that produce milk and cheese for northern Nevada and eastern California.

Crops for human and livestock consumption range from garlic, onions, corn and sunflowers, to fruit, wheat and oats.

[3]

Carson River Mercury Superfund Site

[3]cwsd.org/watershed

- Women and children need to be informed about the fish advisory
- Many people continue to eat the fish
- Is CRMS related to the Fallon cancer cluster?
- Have all the areas of contamination been identified? How do we know for sure?
- Mining operations in the Virginia City and Silver City area:
  - » Are current operations releasing mercury into the air?
  - » What can be done to ensure health is protected for current and future mining activities?

- Why are there no controls on the Sacramento Blackfish after it is removed from Lahontan Reservoir?
  - » Are people unknowingly purchasing this fish in markets and consuming high levels of mercury?

- What are the restrictions on duck hunting in the USFWS refuges?
  - » Is there a potential contamination pathway due to the high levels of mercury that concentrate in duck livers?

People are also concerned for the environmental health of the area. The natural landscape and its' resources are an integral part of the community.

important environmental health questions and concerns raised by community:

- Is dust being disturbed around the source areas?
- Are current gold mining operations contributing to the contamination and releasing more mercury into the air?
- Duck hunting that occurs in the USFWS refuges where ducks have potentially high concentrations of mercury in their livers
- Could floods, gully washes and mitigation make the contamination worse?
- The protection of individual water rights for property owners

There are ongoing projects in place to restore the banks of the river and several environmental organizations in the area. Some of these organizations include:

- Carson Water Subconservancy District (**cwsd.org**)
- River Wranglers (**riverwranglers.blogspot.com**)
- Dayton Valley Conservation District (**dcnr.nv.gov/conservation-district-program**)
- Lahontan Conservation District (**dcnr.nv.gov/conservation-district-program**)
- Healthy Communities Coalition (**www.healthycomm.org**)
- Nature Conservancy (**www.nature.org/ourinitiatives/regions/northamerica/unitedstates/nevada/placesweprotect/carson-river-project.xml**)
- Keep Truckee Meadows Beautiful (**ktmb.org**)
- Great Basin Bird Observatory (**www.gbbo.org**)

economy and agriculture

Members of the community have raised concerns surrounding property values, damage to business, and future development. The stigma of the "Superfund" label is an issue of concern for some in the community. People feel that property values will be negatively affected, that realtors will not want to disclose the Superfund site information and that property owners are not currently following the proper protocols for remediating private land.

Agriculture is a large part of the area's economy. There are concerns that restrictions put in place by the Superfund cleanup may limit the agricultural industry and economic vitality in the area. People asked questions such as, "Would irrigation be affected?" and "How will commercial real estate development near the River be monitored and permitted?" Area-specific businesses, such as the dry milk industry, are also significant contributors to the economy; any impact to them could be problematic for the whole area.

Development projects will continue to arise within the boundaries of CRMS. Economic development is currently a growing force in this area, fostering job creation, industry and innovation. However, as there is a threatened release of mercury contamination into the environment through some development projects, EPA, the state, and stakeholder groups must be conscious of all potential impacts of development. The CRMS cleanup is a long term project, and will therefore need to function within this increasingly developing area. EPA hopes to foster a symbiotic relationship between developers, stakeholders and any agencies involved in the project. It is necessary to support economic growth while also protecting human health and the environment.

recreation andrtadition

The Lahontan Reservoir is a central recreational area in western Nevada. The reservoir is almost 17 miles long with 69 miles of shoreline. When full, it contains 12,000 surface acres of water. This reservoir, the third largest in the state, is very important to the local economy. The area is open all year, though is used most often during the late spring through the summer. Primary activities on the reservoir and surrounding area include boating, water skiing, fishing and camping. Catch-and-release bank and boat fishing techniques are used to catch walleye, white bass, catfish, trout and other game fish.

Fish Advisory Sign at Lahontan

healthy Communities Coalition (hCC)

The Healthy Communities Coalition is a valuable resource in outreach for CRMS. From their website:

"HCC serves a diverse population over several hundred miles, throughout Lyon, Storey, and Mineral Counties in northern Nevada. The coalition is a collaboration of local residents and groups who have worked to determine best strategies to address local problems. They implement strategies through the coordination of community partners, members and volunteers, and provide ways for communities to become healthier and happier by working together on common goals.

Some Things HCC Does:

- Helping community groups obtain necessary funding through collaborative grants and fundraising
- Collecting and distributing data on community issues and creating plans for addressing them
- Sharing resources with community agencies and helping them enhance their services
- Creating awareness of community issues, resources, agencies, services, and events
- Mobilizing citizens to address a local issues

The coalition membership works with federal, state and local agencies and community members to form strategy teams to address current needs."[4]

Visit the Healthy Communities Coalition website at **www.healthycomm.org** to learn more.

virginia City: a national historic Preservation area

Virginia City and its surrounding area were the center of the gold and silver ore boom in 1859. The Comstock Lode, as it soon became known, was the first major silver deposit discovered in the United States. This mining boomtown appeared virtually overnight as a result of the Comstock Lode. At its peak, Virginia City had a population of over 15,000 residents and was called "the richest city in America."

Virginia City was declared a National Historic Landmark in 1961. The Historic District encompasses Virginia City, Gold Hill, Dayton, and Silver City. The entire area is archeologically protected as a result of this historic landmark status. It is one of six National Historic Landmarks in the state of Nevada. While this recognition preserves a momentous time in America's history, it also presents issues for current day efforts to remediate CRMS. Due to the restrictions around National Historic Landmarks, EPA and NDEP often face issues in conducting sampling events and proposing remediation to contaminated areas. This is one of the ongoing challenges the CRMS site team faces- preserving history while protecting human health and the environment.[5]

[4]www.healthycomm.org
[5]tps.cr.mps.gov
[6]www.desertusa.com

virginia City events Calendar[6]

Gunfighter Exhibitions occur the second Saturday of each month at 11:00am and 2:00pm in the central areas of C Street, beginning in May.

march
Mountain Oyster Fry

may
Comstock Historic Preservation Week "Fire on the Comstock."

June
Commemoration of Gold is discovered! (1859)

July
"Fastest Gun Alive" National Fast Draw Championship

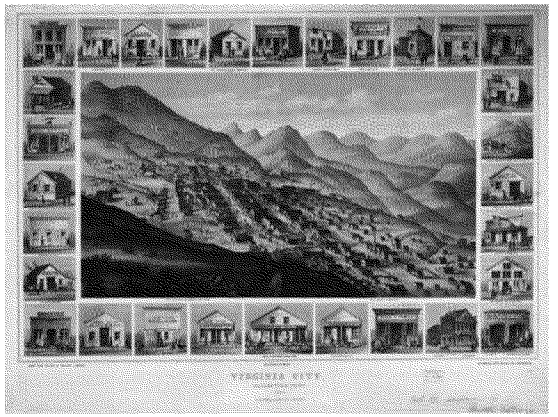
august
Civil War Encampment Reenactment

september
International Camel Races

october
Virginia City Commemoration of the Great Fire of 1875

november
Veteran's Day Parade. "The Only Veteran's parade in Nevada."

december
Christmas on the Comstock Parade of Lights, Tree Lighting, Caroling and Fireworks



Virginia City Historical Map

The Lahontan recreation area is rich in natural resources. The park's vegetation is mainly high desert sagebrush, with wooded areas of native cottonwoods and willows. **Riparian zones** can be found up and downstream of the lake along the Carson River. Wildlife including wild horses, bobcat, coyote, fox and deer roam the park, along with several types of birds. Migratory waterfowl, pelicans, herons, egrets, hawks and the rare bald eagle nest in the area.[7]

natural and historic recreation areas nearby (visit http://parks.nv.gov):

- Washoe Lake State Park
- Lahontan Recreation Area
- Sheckler Reservoir
- Carson Lake
- Indian Lakes
- Stillwater National Wildlife Refuge Complex
- Fort Churchill State Historic Park
- Dayton State Park

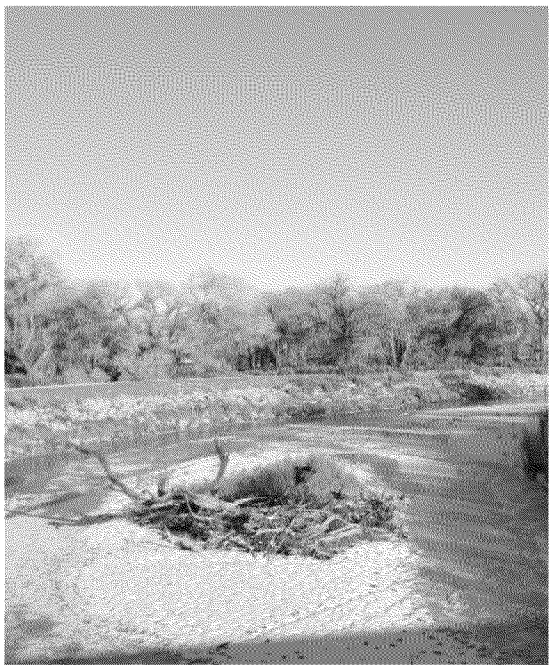
the Community involvement action Plan

Community

Communications and Public Education Preferences

Information Outreach

Community members receive information through several different outlets. Therefore, EPA's approach to disseminating site related information is multi-faceted. It includes print material (i.e., fact sheets, newspapers), online forums, radio, signage and community meetings. Refer to the list below for the suggested outlets of communication.



Carson River Mercury Site Communication Outlets

TV Stations	KTVN 2 CBS affiliate; KRNV 4 NBC affiliate; KNPB 5 PBS affiliate, KOLO 8 ABC affiliate, KRXI 11 Fox affiliate, KREN 27 Univision affiliate
FM Radio Stations	KUNR 88.7 FM (Reno), KWFP 92.1 FM (Reno), KSVL 92.3 FM (Smith Valley), KYSA 92.9 FM (Reno), KTHX 100.1 FM (Dayton), KRNG 101.3 FM (Fallon), 104.1 KRZQ (Fallon), 105.7 KOZZ (Reno), KNEZ 107.3 FM (Fernley), KSRN 107.7 FM (Spanish- Kings Beach), and KXNV 89.1 (Reno)
AM Radio Stations	KHWG 750 AM (Fallon), KKOH 780 AM (Reno), KVLV 980 AM (Fallon), KCMY 1300 AM (Carson City), KXEQ 1340 AM (Spanish-Reno), and KNNR 1400 AM (Sparks)
Newspapers	Virginia City News (Virginia City); Comstock Chronicle, weekly, Friday (Virginia City); Mason Valley News, weekly, Wed. and on-line (Yerington), Fernley Leader Courier, weekly, Wed. and on-line (Dayton & Fernley), Lahontan Valley Times (Fallon), Nevada Appeal, daily and on-line (Carson City), Reno Gazette Journal, daily and on-line (Reno metro area)
Newsletters	Carson Water Subconservancy District's "The Flow", Community Chest's Newsletter; Storey County's "Breaking News" (on-line http://www.storeycounty.org/news.asp)
Web	Facebook ("Dayton Peeps"); Comstock Resident's Association www.comstockresidents.org/wp; washoevalley.org
Public Posting	Identify the post offices, laundromats, community centers, etc. where public notices will be posted

Carson River Mercury Superfund Site

Community meetings and Public events

One of the most effective ways of disseminating information is through already scheduled meetings and public events. Below find a schedule of some of the regular meetings at which CRMS could and will be discussed.

Nevada Open Meeting Law: The Nevada Open Meeting Law (OML) was enacted in 1960 to ensure that the actions and deliberations of public bodies be conducted openly. The OML governs meetings of public bodies, and all meetings EPA conducts with state and counties are subject to this law. Refer to the publications section for a link to the complete Nevada OML manual.

Carson City: Two regular public meetings are held by the Board of Supervisors on the first and third Thursdays of each month beginning at 8:30am in the Sierra Room of the Community Center. Meetings are televised live and can be viewed on Channel 226 as well as webcast and archived on **www.acctv.org**

Physical Address: City Hall
201 N. Carson Street, Suite 2
Carson City, NV 89701
(775) 887-2100

A List of Carson City's Boards, Committees and Commissions can be found here:
www.carson.gr

Storey County: Board of Commissioners meets every first and third Tuesday of the month.

Contact the Storey County Commissioners:
www.storeycounty.or

select events throughout Crms:

Carson river Watershed Busotur
Carson City – June

oodles of noodles Festival
Dayton – June

night in the Country usic Festival
Yerington – July

spring Wings Bird Festival
Churchill County – April

Jazz and Beyond usic Festival
Carson City – August

Storey County Administrator's office at (775) 847-0968 or *info@storeycounty.org*

Physical Address: Court House
26 South B Street
Virginia City, NV 89440

Lyon County: Lyon County Board of Commissioners: **www.lyoncounty.gov**

Lyon County Citizen's Advisory Board Website:
www.lyon-county.gov

Churchill County: County Commissioners meetings are held at 8:15am on the first Thursday of each month and 1:15 pm on the third Wednesday of each month.

To contact the Churchill County Commissioners, contact Deputy Clerk of the Board Pamela D. Moore at (775) 423-4092. You may also reach the Commission by fax at (775) 423-7069 or by mail:

Churchill County Commissioners
155 N. Taylor Street, Suite 110
Fallon, NV 89406

Washoe County: County Commission meetings are held twice a month on the second and fourth Tuesdays of each month, starting at 10am. Public hearings are scheduled at 6pm on meeting days.

Commission meetings are televised live and replayed on the Washoe Channel.

Physical Address: 1001 E. Ninth Street, Bldg. A
Reno, NV 89512

Mailing Address: PO Box 11130
Reno, NV 89520
(775) 328-2005
Fax: (775) 328-2037

Commissioner info: **www.washoecounty.us**

Washoe County Citizen Advisory Board info:
www.washoecounty.us

Washoe County Advisory Boards Website:
www.washoecounty.us/cab

Additional advisory boards exist in the area, including Dayton Regional Advisory Board, Stagecoach Advisory Board and Silver Springs Advisory Board.

Fish advisory

Due to elevated levels of **methylmercury** in fish, the Nevada State Health Division has issued health advisories recommending limits on consumption of fish species from six northern Nevada waters. The health advisories recommend no consumption of any fish from Big and Little Washoe Lakes, Lahontan Reservoir and the Carson River from Dayton downstream to the reservoir. Mercury can cause permanent damage to the nervous system and serious disabilities for developing fetuses. Catch and release, swimming and recreation are safe.

When community members were asked about the best way to inform people of the fish advisory, they came up with several options that EPA and NDEP will explore:

- Creating a PSA
- Posting signs wherever there are openings/ fishing areas, such as near the:
  - » Carson River and Lake
  - » Washoe Lake
  - » Lahontan Reservoir
  - » Sheckler Reservoir
  - » Indian Lakes
  - » Stillwater Wildlife Refuge – in which the state advises limited or no consumption of fish and ducks at the Site due to high levels of mercury
- Website links
- Include information in fishing licenses
- Reach out to sporting stores, bait shops and fishing organizations
- Work with Healthy Communities – food distribution events and health fairs

Challenges of the Fish advisory

Successful outreach and implementation of the fish advisory is a challenge for EPA and NDEP due to the local fishing culture. Many anglers have resisted adopting the recommended practice of catch-and-release fishing, instead choosing to bring catch home for consumption. EPA asked community members to share their perspectives on this issue, and three main points were identified by the interviewees:

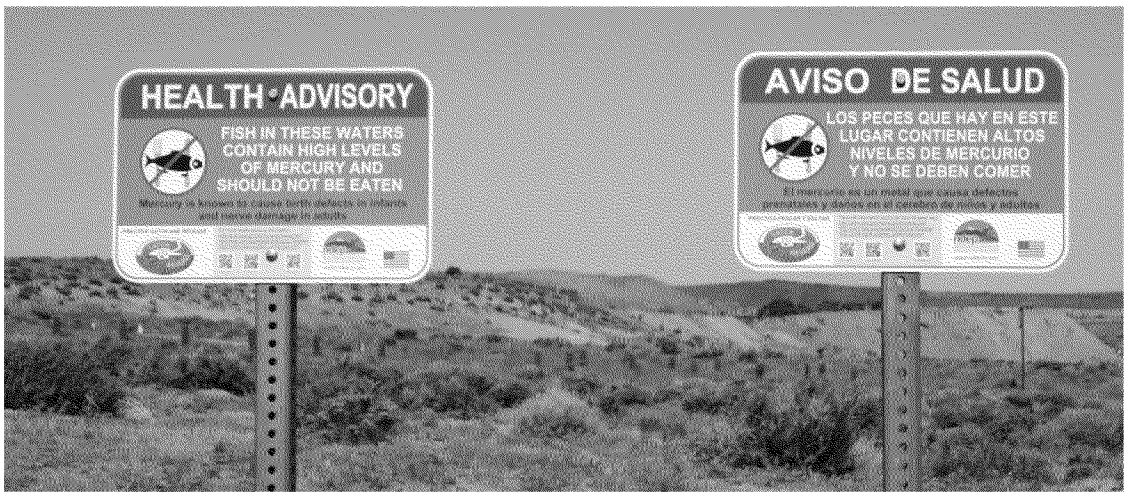
1. People believe that the contamination has been dealt with/was cleaned up in the 1990s
2. People do not believe that the fish is contaminated, or if they do, they do not think that it will cause harmful health effects (i.e. "My family has been eating this fish for years")
3. There is a lack of information dissemination and education related to the fish advisory, especially in Hispanic and Tribal communities and any others who may be subsistence fishing.

addressing the Challenges

By receiving feedback from the community, EPA and NDEP developed a more comprehensive fish advisory approach and have already begun to take action. The central facets of this approach are:

1. Promotion of the Fish Advisory
   a. Community meetings
   b. EPA and NDEP websites
   c. Public Forums
2. Development and installation of clear, bilingual signs at common fishing spots
3. Providing a continued source of information concerning mercury health effects and fish advisories through partnership with ATSDR and local organizations.

Mercury Advisory Sign



limiting exposure the long-term sampling and response Plan (ltsrP)

EPA and NDEP have made improvements to the management of the Carson River Mercury Site to better protect residents from exposure to elevated levels of mercury, arsenic, and lead. The changes are designed to protect families, specifically young children, from exposures that can cause adverse health effects.

The improvements include:

1. Renewed attention to soil sampling at residential properties to identify those areas with elevated levels of mercury, arsenic, and lead.
2. Better mapping of likely contamination to help residents determine if their property may be affected.
3. Updated cleanup levels to better protect public health.

After extensive sampling of residential soil in Dayton and Silver City and the cleanup of five residential properties, EPA recognized that a long-term plan was needed. The investigation could not characterize the entire span of the CRMS, and therefore future residential development could result in families living on properties with soil containing elevated levels of contamination. EPA and NDEP developed the Long-term Sampling and Response Plan to meet the needs of the community. The LTSRP requires that any residential development / remodeling / soil disturbance within the boundaries of the CRMS include sampling for mercury, arsenic and lead. It also requires cleanup or remediation if necessary.

To assure that small subdivisions and individual home construction activities do not place CRMS residents at risk for exposure to elevated levels of mercury, arsenic, or lead, EPA and NDEP have updated the LTSRP and are reaching out to homeowners and county building departments to make them aware of the LTSRP requirements. Any residential construction activity within the CRMS that disturbs more than three cubic yards of soil or sediment, or any amount of tailings material, must first include sampling to make sure that levels of the three contaminants do not pose a risk to resident's health. Construction activities include, but are not limited to, individual property development, minor and major property subdivision construction activities, swimming pool excavation / installation, grading, home additions, and utility ditching / trenching. If levels of mercury, arsenic, and lead are found by anyone above the CRMS clean-up levels, then the contaminated material must be removed or covered.

individual landowners and homeowners

It is a concern of EPA and NDEP that the provisions of the LTSRP designed to protect public health not place an undue administrative or financial burden on CRMS homeowners. Therefore, individual landowners can contact the NDEP and request that NDEP personnel conduct a metals screening of their property. NDEP will arrange a site visit to conduct field portable x-ray fluorescence soil screening to determine approximate on-site metals levels. Based on the results of soil screening, the landowner, in consultation with NDEP, can determine if more sampling should be conducted. EPA funds may be available for any necessary remediation.

These services are intended to assist individual homeowners and tenants, and do not apply to residential developers or residences built for speculation. Residents can contact EPA or NDEP with the contact information provided at the end of this plan to learn more about the LTSRP.

more information

information repositories

The public information repositories for the site are at the following locations:

Churchill County Library
553 South Maine Street
Fallon, NV 89406
(775) 423-7581

Dayton Valley Library
650 Highway 50, Space 6
Dayton, NV 89403
(775) 246-7444

Nevada State Library
100 Stewart Street
Carson City, NV 89710
(775) 687-5160

The most complete collection of documents is the official EPA site file, maintained at the following location:

Superfund Records Center
Mail Stop SFD-7C
95 Hawthorne Street, Room 403
San Francisco, CA 94105
(415) 820-4700

useful links:

Carson City:	www.carson.org
Carson City Open Space Advisory Committee:	www.carson.org/index.aspx?page=612
Carson City Board of Supervisors webcast:	www.acctv.org
Carson Water Subconservancy District:	cwsd.org
Churchill County:	www.churchillcounty.org
CRMS Natural and Historic Recreation Areas:	parks.nv.gov
Dayton Valley Conservation District:	dcnr.nv.gov/conservation-district-progran
EPA Website:	www.epa.gov/region09/carsonrivermercury
Fallon Pauite-Shoshone Tribe:	www.fpst.org
Great Basin Bird Observatory:	www.gbbo.org
Healthy Communities Coalition:	www.healthycomm.org
Keep Truckee Meadows Beautiful:	ktmb.org
Lahontan Conservation District:	dcnr.nv.gov/conservation-district-progran
Lahontan State Recreation Area:	parks.nv.gov/parks/lahontan-state-recrea area
Lyon County Citizen Advisory Board Website:	www.lyon-county.org/index.aspx?nid=868
Lyon County:	www.lyon-county.org
National Historic Landmarks Program Virginia City Page:	tps.cr.nps.gov/nhl/detail.cfm?resourceid=3 2&resourcetype=district
Nature Conservancy Carson River Project:	www.nature.org/ourinitiatives/regions/ northamerica/unitedstates/nevada/ placesweprotect/carson-river-project.xml
NDEP Carson River:	ndep.nv.gov/bca/carsonriver/criver_1.htm
Open Space Advisory Committee	www.carson.org/index.aspx?page=612
River Wranglers:	riverwranglers.blogspot.com
Storey County:	www.storeycounty.org
The Washoe Channel (Commissioner's Meetings):	www.washoecounty.us/mgrsoff/wctv.html
Virginia City Events Calendar	www.desertusa.com/cities/nv/nv_virginiaci html
Washoe County:	www.washoecounty.us
Washoe Tribe of Nevada and California:	www.washoetribe.us/contents

Community involvement action at CRMS: a summary of Points

- Always use a multi-faceted approach to communication and use the outlets described in this plan
- Coordinate with state, tribal, and local groups
- Be flexible! Offer to meet with groups on their schedule
- Attend already scheduled / regular community meetings for maximum effectiveness
- Keep in mind community concerns throughout cleanup process
- Ask for and listen to community's perspectives
- Facilitate discussion on topics important to community and stakeholders
- Explore ways of further promoting the fish advisory, as described in this plan
- Highlight important public participation steps in the cleanup process (see below for more)
- Observe Nevada Open Meeting Law

Upcoming Public Participation Opportunities:

- Meetings and / or open houses to explain the Remedial Investigation
- Meetings and / or open houses prior to the Proposed Plan hearing
- Sampling activities
- Up-to-date Fact Sheets
- Public Comment Period on Proposed Plan

Links to non-EPA websites are for informational purposes only and do not imply endorsement or recommendation by EPA.

Publications and resources:

EPA Basic Information about Mercury:	**www.epa.gov/hg/about.htm**
EPA Basic Information about Lead:	**www2.epa.gov/lead**
EPA Basic Information about Bioavailability:	**www.epa.gov/superfund/bioavailability**
Nevada Open Meeting Law Manual:	**ethics.nv.gov/Coe_website_files/coe_publications_and_media/oml%20manual.pd**
ATSDR Mercury and Human Health Fact Sheet:	**www.atsdr.cdc.gov/tfacts46.pdf**

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Carson River Mercury Superfund Site

aPPendiCes

site history

timeline of events

date	event
Late 1850s	Mercury-contaminated mill tailings discharged to the environment
Early 1970s	Initial discovery of elevated mercury levels in the Carson River
August 1990	CRMS receives final listing on the National Priority List (NPL)
October 1990- August 1992	Mercury-laden tailings excavated and treated in response to orders by the EPA
December 1994	The Human Health Risk Assessment and Remedial Investigation Report is published
December 1994	The Operable Unit (OU) OU1 Feasibility Study is completed
March 1995	The OU1 Record of Decision (ROD) is signed
April 1995	The OU2 Remedial Design begins
September 1996	The OU1 Remedial Design is completed
September 1996	The OU1 Remedial Action begins
July 1997	The OU1 Superfund State Contract is signed
August 1998- January 1999, August – December 1999	The OU1 Remedial Action construction period
September 2003	The first Five Year Review (FYR) report is completed
January 2005	The draft Long-Term Sampling and Response Plan (LTSRP) is developed
April 2008	NDEP finalizes the brochure describing development permitting requirements in the Carson River area
September 2008	The second FYR report is completed
January 2012	Environmental Covenants (ECs) in-progress to address disturbance of remediated areas, and ECs resulting from LTSRP actions made available to the public
September 2012	EPA completes drafting a revised LTSRP to address residential development within the CRMS
2012	Archeological studies of historic mill sites are completed
September 2013	EPA signs the Explanation of Significant Differences (ESD) to address the CRMS boundary definition and changes in cleanup levels for arsenic and lead. Five Year Review completed.
Summer 2014	EPA Headquarters concludes Optimization Review, a high-level evaluation of the OU2 existing data, to identify data gaps and plan for completion of the Remedial Investigation Report

Physical Characteristics

The CRMS begins on the eastern edge of Carson City, Nevada, and includes more than 80 miles of mercury-contaminated river, reservoir, and wetland water and sediments in the middle and lower portions of the Carson River system. It also includes soils and tailings from approximately 263 mill sites where mercury was used to process gold and silver ore mined from the Comstock Lode. The CRMS encompasses areas where mercury contamination has come to reside due to erosion from the mill sites.

According to the Nevada Bureau of Mines and Geology, the Virginia Mountain Range, consisting mostly of volcanic rock overlying **metamorphic rock** and granite, erupted somewhere between 18 million years ago and as recently as 1 million years ago. As the volcanic system waned during later times, hot water continued to seep through fractures in the rock, changing the broken rock and creating minerals. It was believed to be these **hydrothermal systems** that leached original minerals from the rock and deposited the gold and silver that eventually lead to the Comstock mining era. The metallic minerals mercury, arsenic, and lead all occur naturally in ore from the Comstock Lode.

land and resourceuse

Historical land use in the Carson River basin was mostly agriculture and mining in the 1840s and 1850s. Gold was discovered in 1850, and significant processing and production of the metal began in 1859. The mining industry and population in the basin fell rapidly in the 1880s; however, railroad access helped promote ranching and farming. Another change in land use was an increase in irrigated acreage in the Carson Desert, prompted by the impoundment of Lahontan Reservoir in 1915 and the creation of the **Newlands Irrigation Project**. Alfalfa was the principal irrigated crop, in terms of acreage and revenue, in the Newlands Irrigation Project. From 1980 to 1987, the estimated irrigated acreage ranged from 61,000 to 67,000 acres for the Newlands Project. Dayton and Churchill Valleys, which have the smallest populations in the Nevada portion of the Carson basin, are primarily rangeland with agricultural areas along the Carson River. Land use and population remained relatively unchanged in the Carson River basin from 1890 to 1950, until the advent of suburban development.

Since 1950, Carson City and Fallon have grown considerably, with most of the urban and suburban development occurring on land previously used for agriculture. Presently, the local economy and urban land uses are dominated by the retail trade and service sectors, primarily casinos and adjunct businesses such as hotels, motels and restaurants. Areas surrounding the CRMS are expected to continue to experience a high rate of residential growth over the next several decades.

Recently, Comstock Mining Inc. started operations to conduct gold and silver exploration, mining, and processing within the CRMS near Silver City in Storey and Lyon counties.[8]

history of Contamination

Mining in the Carson River drainage basin commenced in 1850 when **placer deposits** were discovered near Dayton at the mouth of Gold Canyon. Throughout the 1850s, mining consisted of working placer deposits for the gold in Gold Canyon and Six Mile Canyon. "The influx of contaminated tailings to the Carson River is believed to have begun immediately with the onset of Comstock mining operations in 1859 (with the most significant quantities entering the river from the beginning of mining through the early 1900s)[9]."

Subsequent exploration of the surrounding mountains identified significant metal-bearing veins and rock that became known as the **Comstock Lode**. The initial ore discovered was extremely rich in gold and silver; gold was more abundant in Gold Canyon while silver was more abundant in Six Mile Canyon. The general milling process employed before 1900 involved pulverizing ore with stamp mills, creating a **slurry**, and adding mercury to the mixture. The mercury formed an amalgam with the precious metals which was then separated from the solution and **retorted**. During the mining era, an estimated 14,000,000 pounds of mercury was discharged into the Carson River drainage, primarily in the form of mercury contaminated tailings.

[8]ndep.nv.gov/bca/carsonriver/criver_1.htm
[9]Millar, C.I. 1996. Tertiary Vegetation History. In, Sierra Nevada Ecosystem Project, Final Report to Congress, Vol II. Assessments and Scientific Basis for Management Options. Davis, Centers for Water and Wildland Resources, University of California. 47-122.

A U.S. Geological Survey (USGS) study first documented elevated levels of mercury in sediment and surface water in the Carson River system in the early 1970s. Subsequent studies further delineated the extent of mercury contamination at historical mill sites, in river and lake sediment, in the adjacent floodplain, and in fish and wildlife. The CRMS was added to the **National Priorities List (NPL)** on August 30, 1990. The extent of mercury contamination has not been fully defined at this time.

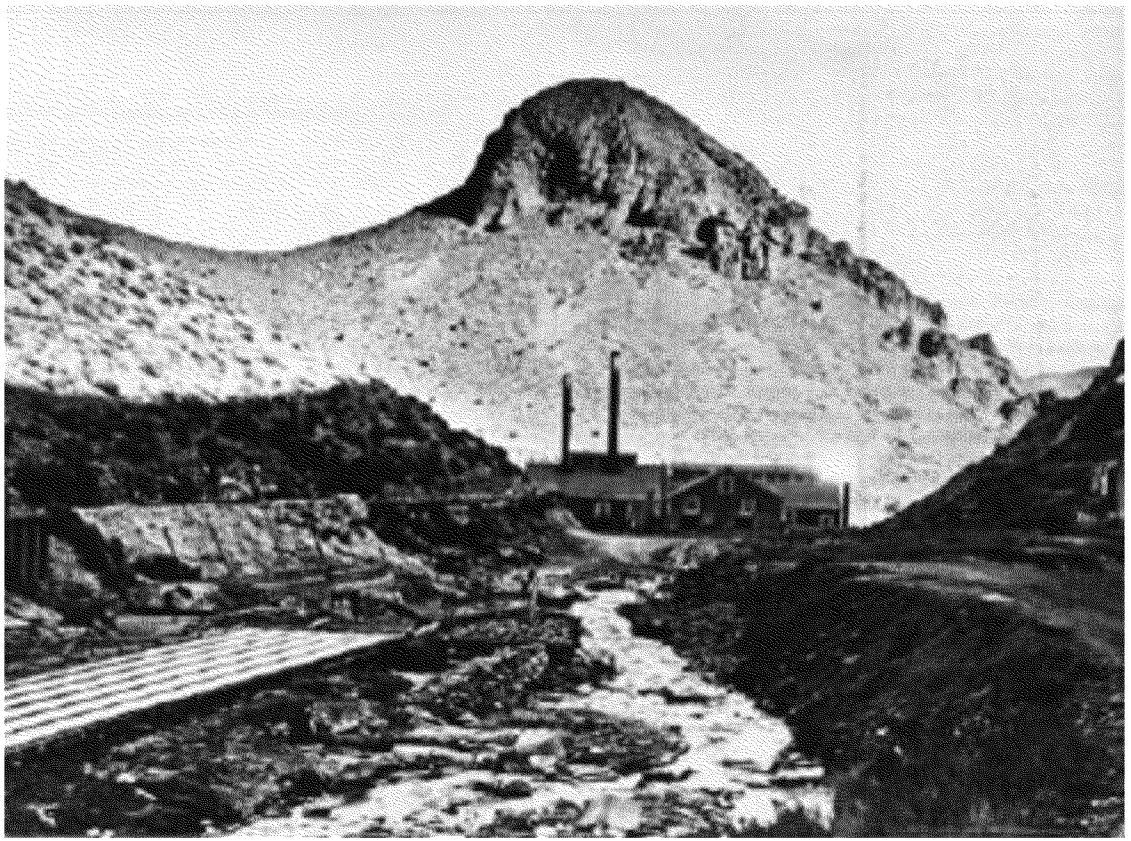
In 1994, EPA Region 9 released the Carson River Human Health Risk Assessment and Remedial Investigation Report. Data gathered in support of the Remedial Investigation included over 1,000 soil samples collected at 131 historic mill sites, and samples of sediment, air, groundwater, surface water, and biota. The report identified mercury, arsenic, and lead as **contaminants of concern** for the CRMS. All three metals occur naturally in ore from the Comstock Lode, but arsenic and lead were concentrated in the milling process, and the addition of mercury as an amalgam greatly exceeded the levels naturally present in the ore.

On March 30, 1995, EPA Region 9 signed a ROD selecting a cleanup remedy for **Operable Unit** 1. The objective of the remedial action was to "reduce human health risks by reducing direct exposure to surface soils containing mercury at concentrations equal to or greater than 80 mg/kg in residential areas." This site-specific cleanup level was established by EPA based on the risk assessment. The level was designed to be protective of a child, age one to six, who would come into contact with mercury contaminated soils. The level is specifically designed for the types of mercury found in the soils at CRMS and the **bioavailability** of those types of mercury. The ROD also determined that the cleanup level for arsenic that was specified in the Nevada Contaminated Soil and Groundwater Remediation Policy was pertinent and would be followed. In 1995, the Nevada standard for arsenic was 80 mg/kg. A lead cleanup level was not established since neither EPA nor the Nevada Policy established a reference dose for lead.

initial response

In October 1990, prior to the signing of the ROD, mercury laden **tailings** located on a 6.5-acre property five miles east of Dayton were excavated and treated in response to an Administrative Order issued by EPA to private property owners. Mercury contamination in soil on this property was found in concentrations as high as 1,500 mg/kg. The Order issued for this site recognized a new residential subdivision in close proximity to the site, unrestricted access to the site, and tire marks from off-road vehicles evident on the contaminated soils as some of the reasons for the

Carson River Mercury Superfund Site



action. The tailings were taken to the Flowery Mine heap leaching facility for treatment by **cyanide heap leach**.

In August 1992, mercury laden tailings located in Dayton were excavated and treated in response to an Administrative Order issued by EPA to private property owners and the Nevada Department of Transportation. Soil with mercury concentrations greater than 25 mg/kg was excavated from an area bounded by U.S. Highway 50 to the east, Douglas Street to the north, and River Road to the west, and taken to the Flowery Mine heap leaching facility for treatment by cyanide heap leach. The remaining excavation was backfilled with clean soil.

As part of the Remedial Investigation/Feasibility Study (RI/FS), EPA conducted historical research to determine the locations of Comstock mills, and to develop general information regarding their operations. The findings to date have identified 263 historic mill sites. NDEP conducted subsequent fieldwork and arrived at a total of 236 mills.

Basis for taking action

The contaminants of concern for the CRMS are mercury, arsenic, and lead. Mercury occurs naturally in Comstock ore, but at low levels. The mercury added for gold and silver amalgamation greatly exceeds the natural levels. Arsenic and lead are naturally occurring metals but were concentrated in the milling waste stream. The presence of these contaminants in soil provided the basis for taking action under **CERCLA**. The primary threat to human health is posed by ingestion of soil in a residential setting by young children, and ingestion of contaminated fish and waterfowl.

remedy selection

The remedial action objective for **OU1** as described in the 1995 ROD was to reduce human health risks by reducing direct exposure to mercury equal to or greater than 80 mg/kg in surface soils in residential areas.

The selected remedy at five residential properties found to have mercury levels above 80 mg/kg in soil in the yard, as described in the 1995 ROD is: Excavation of approximately 5,000 cubic yards of contaminated soils, disposal at a **Resource Conservation and Recovery Act (RCRA)** municipal and/or hazardous waste landfill, and restoration of properties. In the event that there is residual contamination in the subsurface soil and it is not addressed, then this alternative may also include **institutional controls (ICs)**; and implementation of ICs to ensure that any residential development in present open land use areas known or suspected to be impacted by mercury includes characterizing mercury levels in surface soils and, if necessary, addressing impacted soils. These ICs will be referred to as the **Long-Term Sampling and Response Plan (LTSRP)**. See text box on page 11 for more on the LTSRP.

Superfund Cleanup Process & Opportunities For Public Participation

What is Superfund?

Superfund was established in 1980 by an act of Congress, giving EPA the funds and authority to clean up polluted sites.

Goals of Superfund:

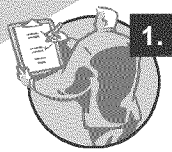
- Protect human health and the environment by cleaning up polluted sites
- Involve communities in the Superfund process
- Make responsible parties pay for work performed at Superfund sites

Superfund Cleanup Process and opportunities for Public Participation

There are several steps involved in cleaning up a polluted site. Once a polluted or potentially polluted site has been reported to EPA by individual citizens, state agencies, or others, EPA follows a step-by-step process to determine the best way to clean up the site and protect human health and the environment. Opportunities for community involvement occur throughout the process.

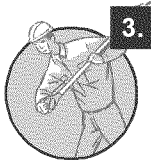
For additional information, visit **www.epa.gov/superfund.**

the suPerFund ProCess

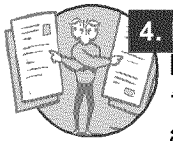


1. Preliminary assessment/site inspection
EPA evaluates the potential or actual risk posed by hazardous waste from a site to determine whether designating it as a Superfund site (in other words, placing it on the NPL) is warranted.

2. Placement on the National Priorities List (NPL)
EPA adds the site to the National Priorities List.



3. remedial Investigation
The levels and location of contamination at the site are studied, and risks to human health and the environment are evaluated.

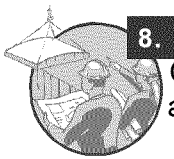


4. Feasibility study
Potential cleanup technologies for the site are explored, compared and evaluated.

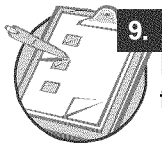
5. Proposed Plan
Community members can comment on the proposed cleanup alternatives for the site.

6. record of decision
EPA explains which cleanup alternative(s) will be used to clean up the site in a public document called the Record of Decision.

7. remedial design
Design of the cleanup technologies that will be used at the site.



8. remedial action
Construction of the cleanup technologies and the actual cleanup of the site.



9. long-term operations and maintenance
Measures designed to ensure that the remedy is protective of human health and the environment.

glossary

Arsenic: a semi-metal element in the periodic table. It is odorless and tasteless. It is hazardous to health if breathed or swallowed. It enters drinking water supplies from natural deposits in the earth or from agricultural and industrial practices.

Bioaccumulation: General term describing a process by which chemicals are taken up by an organism either directly from exposure to a contaminated medium or by consumption of food containing the chemical.

Bioavailability: the amount of a contaminant that is absorbed into the body following skin contact, ingestion, or inhalation.

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) commonly known as Superfund, was enacted by Congress on December 11, 1980.

Comstock Lode: a rich deposit of silver and gold ore: discovered in 1859 by Henry T. P. Comstock near Virginia City, Nev.

Contaminants of Concern: COCs are the chemical substances found at the site that the EPA has determined pose an unacceptable risk to human health or the environment. These are the substances that are addressed by cleanup actions at the site.

Contamination: Introduction into water, air, and soil of microorganisms, chemicals, toxic substances, wastes, or wastewater in a concentration that makes the medium unfit for its next intended use.

Cyanide Heap Leach: an industrial mining process to extract precious metals, copper, uranium, and other compounds from ore via a series of chemical reactions that absorb specific minerals and then re-separates them after their division from other earth materials.

Hydrothermal systems: Underground reservoirs that produce either dry steam or a mixture of steam and water.

Institutional Controls: Non-engineered instruments, such as administrative and legal controls, that help to minimize the potential for human exposure to contamination and/or protect the integrity of a response action. They are typically used in conjunction with, or as a supplement to, other measures, such as waste treatment or containment. There are generally four categories of ICs: governmental controls; proprietary controls; enforcement and permit tools with IC components; and information devices.

Lead: a naturally occurring element found in small amounts in the earth's crust. While it has some beneficial uses, it can be toxic to humans and animals causing of health effects.

Metamorphic rock: Rock that was once one form of rock but has changed to another under the influence of heat, pressure, or some other agent without passing through a liquid phase.

Methylmercury: CH_3Hg^+, organic form of mercury and the form of mercury that is most easily bioaccumulated in organisms; a neurotoxin. One organic form of mercury, can accumulate up the food chain in aquatic systems and lead to high concentrations of MeHg (methylmercury) in predatory fish, which, when consumed by humans, can result in an increased risk of adverse effects in highly exposed or sensitive populations. Consumption of contaminated fish is the major source of human exposure to MeHg in the United States.

National Priorities List (NPL): EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under Superfund. The list is based primarily on the score a site receives from the Hazard Ranking System. EPA is required to update the NPL at least once a year. A site must be on the NPL to receive money from the Trust Fund for remedial action.

Newlands Irrigation Project: One of the first Department of the Interior, U.S. Bureau of Reclamation (Reclamation Service at that time) irrigation projects completed in the United States. The project was authorized originally as the Truckee-Carson Irrigation Project on March 14, 1903 by the Secretary of the Interior and was renamed the Newlands Project in 1919 in honor of Nevada Senator Francis G. Newlands, who originally sponsored the 1902 Reclamation Act.

Operable Unit (OU): Term for each of a number of separate activities undertaken as part of a Superfund site cleanup. A typical operable unit would be removal of drums and tanks from the surface of a site.

Placer Deposits: in geology, a placer deposit or placer is an accumulation of valuable minerals formed by gravity separation during sedimentary processes. The name is from the Spanish word placer, meaning "alluvial sand".

Remedy: Long-term action that stops or substantially reduces a release or threat of a release of hazardous substances.

Remedial Investigation/Feasibility Study: The remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature and extent of the waste;
- assess risk to human health and the environment; and
- conduct treatability testing to evaluate the potential performance and cost of the treatment technologies that are being considered.

The feasibility study (FS) is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions. The two studies are performed concurrently in a phased approach to encourage the continual scoping of the site characterization effort, which minimizes the collection of unnecessary data and maximizes data quality.

Resource Conservation and Recovery Act: The Resource Conservation and Recovery Act (RCRA) gives EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

Retorted: heat in a retort in order to separate or purify

Riparian Zone: the interface between land and a river or stream.

Slurry: a thick mixture of water and another substance (such as mud or lime).

Source: An area where a hazardous substance may have been deposited, stored, disposed, or placed. Also, soil that may have become contaminated as a result of hazardous substance migration. In general, however, the volumes of air, ground water, surface water, and surface water sediments that may have become contaminated through migration are not considered sources.

Tailings: materials left over after extraction of valuable minerals from ore.

Watershed: the area of land where all of the water that is under it or drains off of it goes into the same place.

list oF aCronyms:

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIP	Community Involvement Plan
CRMS	Carson River Mercury Site
EPA	Environmental Protection Agency
IC	Institutional Control
LTSRP	Long-term Sampling and Response Plan
NDEP	Nevada Department of Environmental Protection
NPL	National Priorities List
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study

Community Questionnaire

Community interviewee responses to these questions in 2013 are the central source of information for this CIP

Interviewee:_____ Date/Time: at _____ am/pm Interviewers: __Jere Johnson, EPA __Leana Rosetti, EPA __Andy Bain, EPA

Questions for rPCi

history

1. How long have you lived/worked in this area?
2. Are you familiar with the Carson River Mercury Superfund Site?
   ___Yes ___No – Skip to #8
   How would you rate your familiarity on a scale of 1 – 10? (1 = not at all familiar and 10 = very familiar)
3. How did you first become aware of contamination associated with the Site?
4. What is your understanding of the contamination related to the Superfund Site?

Concerns

5. Do you have concerns about this site? Are you aware of any community concerns regarding the site or its operation and administration? Please explain.
6. Have you shared these concerns with anyone from the project? Are you aware of anything that has been done to address these concerns?
7. What about the site cleanup interests you? What issues are important for EPA/NDEP/partner organizations to focus on when engaging the community?

level of Confidence

8. Have you had any site related experience with EPA and NDEP and any other government agencies or officials? If so, how would you describe your experience?

Communication and Involvement
Fish advisory

9. Are you aware of the fish advisory for Carson River and the Lahontan Reservoir? What do you think the awareness level is regarding this advisory?
10. What populations do you think may be consuming the fish? (Subsistence fishermen, sports fishermen, ethnicity/language, geographic areas)
11. Does the advisory need to be better, and if so, what would be the best way to raise awareness? What kind of message would be most effective? (For example, are people aware, but need more information about why it's important and how it could affect them?)
12. Are there any fishing or health organizations you are familiar with that may be good partners for increasing the fish advisory outreach?

general

13. Are you familiar with the web site overviews from EPA and NDEP, and/or recent fact sheets?
    a. Is the information clear and easy to understand?
14. How do you see public participation as benefitting the cleanup, and in what ways can this participation be maximized?
15. What is the best way to provide information to you? (Newsletters, fact sheets, community meetings, websites, Community Advisory Groups, other)
    a. How frequently?
    b. Are you willing to share the information you receive with others? Who are/would be the first 5 people you would share project information with?
16. What news outlets (papers, websites, radio) do you most frequently use?
17. In your opinion, what days of the week (and times) are best for community meetings?
18. If a Community Advisory Group is suggested, what groups or representatives do you think would be interested? Where, how often should it meet?
19. Are you aware of the information repositories at the Nevada State Library, Dayton Valley Library and Churchill County Library?
    ___Yes ___No
20. Do you think these locations are convenient for the community?
21. Are you interested in being on the mailing list to receive information updates on environmental cleanup activities at the Superfund Site?
    ___Yes ___No If so, can we confirm your address (and e-mail address)?
22. Are there certain hard to reach populations that we should be aware of? What would be the best way to reach them?
23. Anything else you'd like to add?
24. Anyone else we should interview?

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Carson River Mercury Superfund Site
www.epa.gov/region9/carsonrivermercury
EPA-909-K-15-001

Community Involvement Plan
July 2015

EPA United States Environmental Protection Agency